ما هم کلا میریم تقسیم اینجا ←

۱ ← الف ←

$$y = \frac{x+3}{2x^3+3x^2-8x+3}$$

$$\begin{array}{l|l} 2x^3+3x^2-8x+3 & x-1 \\ \hline -2x^3+2x^2 & 2x^2+5x-3 \\ \quad 5x^2-8x & \\ \quad -5x^2+5x & \\ \qquad -3x+3 & \\ \qquad 3x-3 & \\ \qquad\quad 0 & \end{array}$$

$2x^2+5x-3 \xrightarrow{\times} x^2+5x-6 \,/\, 2$

$(x-1)(x+6)$

$(x-1)(x-1)(x+6) \neq 0 \to \boxed{D_f = R - \{1, \tfrac{1}{2}, -3\}}$

$1 \qquad \tfrac{1}{2} \qquad -3$

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۱ ← ب ←

$$y = \frac{x+3}{2x^3+9x^2+10x+3}$$

$$\begin{array}{l|l} 2x^3+9x^2+10x+3 & x+1 \\ \hline -2x^3-2x^2 & 2x^2+7x+3 \\ \quad 7x^2+10x & \\ \quad -7x^2-7x & \\ \qquad 3x+3 & \\ \qquad -3x-3 & \\ \qquad\quad 0 & \end{array}$$

$2x^2+7x+3 \xrightarrow{\times} x^2+7x+6 \,/\, 2$

$(x+6)(x+1)$

$\hookrightarrow -3 \qquad \hookrightarrow -\tfrac{1}{2}$

$(x+1)(x+6)(x+1) \neq 0 \to \boxed{D_f = R - \{-3, -1, -\tfrac{1}{2}\}}$

$\hookrightarrow -1 \qquad \hookrightarrow -3 \qquad \hookrightarrow -\tfrac{1}{2}$

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۲ ← الف ←

$$y = \frac{x+3}{x^3-2x^2+2x-1}$$

$$\begin{array}{l|l} x^3-2x^2+2x-1 & x-1 \\ \hline -x^3+x^2 & x^2-x+1 \to \Delta<0 \to \text{ریشه ندارد} \\ \quad -x^2+2x & \\ \quad x^2-x & \\ \qquad x-1 & \\ \qquad -x+1 & \end{array}$$

$$\to (x-1)(x^2-x+1) \Rightarrow D_f = R - \{1\}$$

$\hookrightarrow 1$

← سوال ۲

$$y = \sqrt{\dfrac{x+3}{x^3 - 2x^2 + 2x - 1}} \qquad x+3 \to -3 \qquad x^3-2x^2+2x-1 \xrightarrow{\text{ریشه}} 1$$

$$\begin{array}{r|l} x^3 - 2x^2 + 2x - 1 & x-1 \\ \hline -x^3 + x^2 & x^2 - x + 1 \Rightarrow \Delta < 0 \Rightarrow \text{ریشه ندارد} \\ -x^2 + 2x & \\ x^2 - x & \\ x - 1 & \\ -x + 1 & \end{array}$$

x		-3		1	
	$+$	0	$-$	$\nexists$	$+$

$$\to (x-1)(x^2-x+1)$$

$\hookrightarrow 1$

$$D_f = (-\infty, 3] \cup (1, +\infty)$$

$$y = \frac{2}{x^2 - 5|x-1| - 2x + 5} \to \qquad \leftarrow 3$$

$R^- \Rightarrow x^2 + 5x - 5 - 2x + 5 \neq 0 \Rightarrow x^2 + 3x \neq 0 \Rightarrow$

$x(x+3) \neq 0$

$\swarrow 0 \quad \swarrow -3$

و $R^+ \Rightarrow x^2 - 5x + 5 - 2x + 5 \neq 0 \Rightarrow x^2 - 7x + 10 \neq 0 \Rightarrow$

$(x-2)(x-5) \neq 0$

$\swarrow 2 \quad \swarrow 5$

$\rightarrow D_f = \mathbb{R} - \{-3, 0, 2, 5\}$

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۴ الف ←

$$g = \frac{x+3}{|2x+1| - |x+3|} \rightarrow$$

$$2x+1+x+3 = 3x \neq -4 \rightarrow x \neq -\frac{4}{3}$$

$$2x+1-x-3 = x-2 \neq 0 \rightarrow x \neq 2$$

$$D_f = \mathbb{R} - \left\{-\frac{4}{3}, 2\right\}$$

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۴ ب

$$g = \sqrt{|2x+1| - |x+3|} \rightarrow |2x+1| - |x+3| \geq 0$$

$$\rightarrow |2x+1| \geq |x+3| \xrightarrow{\text{توان } 2} \underbrace{3x^2 - 2x - 8}_{\times} \geq 0 \longrightarrow$$

$$x^2 - 2x - 24 = 0 \rightarrow (x-6)(x+4) = 0 \rightarrow x = 2,\ x = -\frac{4}{3}$$

	$-\frac{4}{3}$		2	
$+$	0	$-$	0	$+$

$$\rightarrow D_f = \left(-\infty, -\frac{4}{3}\right] \cup [2, +\infty)$$

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۵ الف ←

$$g = \log_2 (1 - \log_3^x)$$

$$x > 0$$

$$1 - \log_3^x > 0 \rightarrow \log_3^x < 1 \rightarrow x < 3$$

$$\xrightarrow{\cap} D_f = (0, 3)$$

$y = \log_2 \left(1 - \log_{\frac{1}{2}}^{x}\right)$ ← ج ← ۵

$x > 0$

$1 - \log_{\frac{1}{2}}^{x} > 0 \rightarrow \log_{\frac{1}{2}}^{x} < 1 \rightarrow x > \frac{1}{2}$ $\Big\} \xrightarrow{\cap} D_f = (0.5, +\infty)$

$f(x) = \sqrt{\log_{0.5} \log_5^{(2x-1)}} \rightarrow$ ← ۶

$2x - 1 > 0 \rightarrow 2x > 1 \rightarrow x > \frac{1}{2}$

$\log_5^{2x-1} > 0 \rightarrow 2x - 1 > 1 \rightarrow 2x > 2 \rightarrow x > 1$

$\log_{0.5} \log_5^{2x-1} \geq 0 \rightarrow \log_5^{2x-1} \leq 1 \rightarrow 2x - 1 \leq 5 \rightarrow 2x \leq 6 \rightarrow$

$x \leq 3$

$\rightarrow D_f = (1, 3]$

$y = \log^{(2\cos x + 1)}$ $D_f = \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3}\right)$ ← جواب ← ۷

$2\cos x + 1 > 0 \rightarrow 2\cos x > -1 \rightarrow \cos x > -\frac{1}{2} \rightarrow$

$y = \sqrt{\log \frac{x-1}{x+1}}$ ← ج ← ۷

$$\frac{x-1}{x+1} > 0 \to$$

	-1		1	
$+$		$-$		$+$

$\to (-\infty,-1)\cup(1,+\infty)$ ۲

$$\log_{10}\frac{x-1}{x+1} \geq 0 \to \frac{x-1}{x+1} \geq 1 \to \frac{x-1}{x+1} - 1 \geq 0 \to$$

$$\frac{-2}{x+1} \geq 0$$

	-1	
$+$		$-$

$\to (-\infty,-1)$ ۱

$\xrightarrow{\text{اشتراک}}$ $\boxed{D_f = (-\infty,-1)}$

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۸ ←

$$f(x) = \sqrt{(a+2)x^2+ax+b}$$

$$D_f = (-\infty, 3]$$

یک ریشه داره

$\to a+2=0 \to a=-2$

$$f(x) = \sqrt{-2x+b} \to -2x+b \geq 0 \to 2x-b \leq 0$$

$x = 3$

	3	
$+$		$-$

$$6-b=0 \to \boxed{b=6}$$

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۹ ←

$$D_f = R \to \Delta \leq 0$$

$$\leftarrow -8+4m^2 \leq 0 \to m^2-2 \leq -1 \to m^2 \leq 1$$

$$-1 \leq m \leq 1 \to 1-(-1) = \boxed{2}$$

$$f(x) = \frac{\sqrt{4-x^2}}{[x]+[-x]+1} \qquad \leftarrow 15$$

$$4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2$$

$$[x]+[-x]+1 \neq 0 \to [x]+[-x] \neq -1$$

$$\begin{array}{cc} 1.1 & 1.1 \end{array}$$

$$1-2=-1$$

فقط اعداد صحیح $\to \mathbb{Z}$

$$D_f = \{-2, -1, 0, 1, 2\} \to \boxed{5}$$